

Appl. No. 10/716,587
Amdt. Dated Aug 30, 2004
Reply to Office action of Jun 01, 2004

EXPRESS MAIL #EL 971789250 US

Amendments to the Drawings

The attached sheets of drawings include a change to FIG. 1 to repair a minor typographical error identified by the Examiner. Specifically, Applicant has changed the reference sign for the impeller from "104" to "110" to make the drawing consistent with the Specification.

Attachment: Replacement Sheet

REMARKS

Response is hereby made to the Office Action dated June 1, 2004. By this Response, Applicant has amended claims 1, 11-13 and 17. Claims 1-17 remain pending after entry of the foregoing amendments. *Although no fee or extension of time is believed to be required by this Response, the Commissioner is authorized and requested to provide any extensions of time and/or to debit any fees that may be required by this Response (including any fees for additional claims or extensions of time) from Deposit Account No. 50-2091 to avoid abandonment of this Application.*

Applicant has amended the drawings to correct the typographical error in FIG. 1 noted by the Examiner. Reconsideration is requested.

The Office Action rejects each of the pending claims under 35 USC §§ 102(b) and 103, citing several issued United States Patents including US Patents Nos. 4,509,925 (“Wuhrer”), 5,028,210 (“Peterson”) and 4,648,345 (“Wham”). Applicant respectfully traverses the rejections.

Applicant has clarified the pending claims to recite an impeller with at least one pivotable blade and at least one fixed blade, wherein the pivotable blade oscillates as the impeller rotates about the hub/driveshaft. The oscillations of the pivotable blade are further described as having a variable phase. The vehicle is guided to a desired heading by controlling the phase and/or magnitude of the oscillations of the pivotable blade. At least this aspect of the claims is not expressly or impliedly present in any reference of record, nor in any combination of references. Applicant respectfully notes that the prior claims recited pivoting at least one blade of the impeller as the impeller rotates, so the amendments contained within this response are not narrowing in scope, but merely serve to clarify the language previously found in the claims. Accordingly, Applicant does not wish to surrender any legal equivalents to which it would otherwise be entitled.

None of the cited references (taken alone or in combination) disclose at least these aspects of the present claims. The Peterson and Wham references, for example, describe conventional “cyclic” and “collective” steering (i.e. “cyclonic steering”), in which each of the

propeller blades are rotated to change the direction of thrust produced with the propeller (see, e.g., col. 3, lines 20-50 and FIGS. 2a-2e of Peterson, as well as Abstract, line 2 of Wham). While such systems may not require a rudder or other external steering means, changes in direction are still produced by changes in the direction of fluid flow. The presently-claimed systems do not rely upon changes in fluid flow direction, but rather use force imbalances on the blades to produce torque imbalances upon the vehicle, which in turn result in repositioning of the vehicle (see, e.g., FIGS. 4a-4b and accompanying text of the Specification as filed). This torque effect is expressly recited in, for example, claims 13 and 17. Further, each of the independent claims expressly recite that the impeller blades include at least one blade that is pivotable and at least one blade that is fixed, which is not disclosed in the prior art. Indeed, because the prior art systems operate by changing the direction of thrust/fluid flow produced by the impeller, it is necessary that all blades on such systems be pivotable to prevent the types of imbalances exploited by various embodiments of Applicant's invention.

Applicant therefore respectfully requests reconsideration and withdrawal the rejections set forth in the Office Action, and allowance of each of the remaining claims. Should the Examiner have any questions or wish to further discuss this application, Applicant requests that the Examiner contact the undersigned at (480) 385-5060 or bcarlson@ifllaw.com.

Dated

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Respectfully submitted on behalf of
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